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(54) HIGH VARIABLE POWER ZOOM LENS FOR FINITE DISTANCE

(57)Abstract:

PURPOSE: To attain high performance and high variable power ratios by suppressing the powers of the respective groups of the zoom lens having 4-group constitution to a relatively low level and forming a 3rd lens component of two-element constitution of a positive lens and negative lens to enhance the degree of freedom of design.

CONSTITUTION: The 1st lens component, successively from the magnifying side of the zoom lens made of the 4-group constitution, consists of the 5-element constitution consisting of a negative meniscus lens, positive lens, combined lens of the negative meniscus lens and positive meniscus lens, and positive lens; the 2nd lens component consists of the 3-element constitution consisting of a negative lens, negative lens and positive lens, and the 3rd lens component consists of the 2-element constitution consisting of a positive lens and a negative lens. This zoom lens is so constituted as to satisfy inequalities I to III. In the inequalities I to III,  $f_w$  is the shortest focal distance of the entire system,  $f_1$  is the combined focal distance of the 1st lens component,  $f_H$  is the combined focal distance of the 2nd lens component,  $\nu_i$  is the

Abbe number of the  $i$ -th lens. The aberration correction well balanced over the entire variable power range while having the high variable power ratio above 4 times including wide angles up to  $15^\circ$  is possible in this way.

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